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these organisms to light, oxygen, and organic substances. With regard to light, the purple bacteria do not ordinarily show positive phototaxis, but are incited to motility which continues for some time after the light is removed. They are not able to obtain carbon from carbon dioxide in the presence of light. Some forms are even anaerobic, and, unlike most pigment bacteria, can produce pigment under this condition. As to the pigment itself, MOLISCH distinguishes two kinds: the red (*bacteriopurpurin*) and a green (*bacteriochlorin*). The latter is distinct from chlorophyll, which fact agrees with that of their inability to use CO<sub>2</sub>. MOLISCH concludes that nutrition from organic substance is somewhat related to light and the presence of pigment as shown by the increased energy caused by light; and that thus these forms stand between the colorless bacteria and the green algae.—MARY HEFFERAN.

**The typhoid-coli group of bacilli.**—Numerous methods have been proposed for the ready separation and identification of the typhoid and the colon bacilli in water. Such special media as LÖFFLER's malachite-green, MACCONKEY's lactose-bile, ENDO's lactose-fuchsin, and CONRADI-DRIGALSKY's crystal-violet, have been more or less successful in the hands of various workers. These are based upon substances which restrain the growth of one type of organism while allowing a characteristic development of the other. DUCAMP<sup>4</sup> proposes for this purpose the use of an "antibacillary" broth prepared by cultivating in a lactose-peptone solution several strains of *B. coli*, for example, derived from different sources. This broth, when finally filtered germ-free, will be exhausted as a medium for *B. coli*, but will still allow the growth of *B. typhosus*. For the rapid detection of the latter in water, the sample is first plated in phenol broth and inoculations made from the colonies into lactose broth. If a race thus obtained grows in the anticolis and not in the antityphoid broth, and is agglutinated 1:50 by typhoid serum, it is undoubtedly *B. typhosus*.

Studies on the fermentative activities of the typhoid-coli-dysentery group resulted in the confirmation of some facts already known, and brought out some new affinities. *B. para-typhosus*, *B. enteritidis*, *B. psittacosis* Danysz and Thomassen, and hog cholera ferment the same sugars except for two races of hog cholera, which are inactive on xylose, dulcitol, and mannose. *B. para-typhosus* Kurth in addition ferments saccharose and raffinose. *B. para-typhosus* A differs with respect to xylose, mannose, and dulcitol.—MARY HEFFERAN.

## NOTES FOR STUDENTS

**Subterranean fungi.**—ED. FISCHER has recently made a contribution<sup>5</sup> to the morphology of the fungi. The paper is based on the study of material collected

<sup>4</sup> DUCAMP, LOUIS, Contribution à l'étude de la différenciation du colibacille et du bacille typhique. Action des bacilles du groupe coli-typho-dysentérique sur les hydrates de carbone. pp. 181. pl. 1. Thesis. Lille. 1907.

<sup>5</sup> FISCHER, ED., Zur Morphologie der Hypogaeen. Bot. Zeit. 66:141-168. pl. 6. 1908.